



# *Common Market for Eastern and Southern Africa*



## **EDICT OF GOVERNMENT**



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COMESA 218 (2006) (English): Pallets for  
materials handling – Flat pallets – Part 3:  
Maximum working loads

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COMESA HARMONISED  
STANDARD

COMESA/FDHS  
218:2006

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**Pallets for materials handling — Flat pallets —  
Part 3: Maximum working loads**

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REFERENCE: FDHS 218:2006

## Foreword

The Common Market for Eastern and Southern Africa (COMESA) was established in 1994 as a regional economic grouping consisting of 20 member states after signing the co-operation Treaty. In Chapter 15 of the COMESA Treaty, Member States agreed to co-operate on matters of standardisation and Quality assurance with the aim of facilitating the faster movement of goods and services within the region so as to enhance expansion of intra-COMESA trade and industrial expansion.

Co-operation in standardisation is expected to result into having uniformly harmonised standards. Harmonisation of standards within the region is expected to reduce Technical Barriers to Trade that are normally encountered when goods and services are exchanged between COMESA Member States due to differences in technical requirements. Harmonized COMESA Standards are also expected to result into benefits such as greater industrial productivity and competitiveness, increased agricultural production and food security, a more rational exploitation of natural resources among others.

COMESA Standards are developed by the COMESA experts on standards representing the National Standards Bodies and other stakeholders within the region in accordance with international procedures and practices. Standards are approved by circulating Final Draft Harmonized Standards (FDHS) to all member states for a one Month vote. The assumption is that all contentious issues would have been resolved during the previous stages or that an international or regional standard being adopted has been subjected through a development process consistent with accepted international practice.

COMESA Standards are subject to review, to keep pace with technological advances. Users of the COMESA Harmonized Standards are therefore expected to ensure that they always have the latest version of the standards they are implementing.

This COMESA standard is technically identical to ISO/TS 8611-3:2005, *Pallets for materials handling — Flat pallets — Part 3: Maximum working loads*.

<p>A COMESA Harmonized Standard does not purport to include all necessary provisions of a contract. Users are responsible for its correct application.</p>
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**Pallets for materials handling — Flat  
pallets —**

**Part 3:  
Maximum working loads**

*Palettes pour la manutention — Palettes plates —  
Partie 3: Charges maximales en service*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

In other circumstances, particularly when there is an urgent market requirement for such documents, a technical committee may decide to publish other types of normative document:

- an ISO Publicly Available Specification (ISO/PAS) represents an agreement between technical experts in an ISO working group and is accepted for publication if it is approved by more than 50 % of the members of the parent committee casting a vote;
- an ISO Technical Specification (ISO/TS) represents an agreement between the members of a technical committee and is accepted for publication if it is approved by 2/3 of the members of the committee casting a vote.

An ISO/PAS or ISO/TS is reviewed after three years in order to decide whether it will be confirmed for a further three years, revised to become an International Standard, or withdrawn. If the ISO/PAS or ISO/TS is confirmed, it is reviewed again after a further three years, at which time it must either be transformed into an International Standard or be withdrawn.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/TS 8611-3 was prepared by Technical Committee ISO/TC 51, *Pallets for unit load method of materials handling*.

This first edition, together with ISO 8611-1 and ISO 8611-2, cancels and replaces ISO 8611:1991.

ISO/TS 8611 consists of the following parts, under the general title *Pallets for materials handling — Flat pallets*:

- *Part 1: Test methods*
- *Part 2: Performance requirements and selection of tests*
- *Part 3: Maximum working loads*

## Introduction

The changing of the title and the scope of ISO 6780<sup>[1]</sup> from “*General-purpose flat pallets for through transit of goods — Principal dimensions and tolerances*” to “*Flat pallets for intercontinental materials handling — Principal dimensions and tolerances*” made it necessary to revise International Standard ISO 8611:1991 “*General purpose flat pallets for through transit of goods — Test methods*” and the Technical Reports ISO/TR 10232<sup>[2]</sup> and ISO/TR 10233<sup>[3]</sup>. The test methods, performance requirements and maximum working load include not only “general purpose pallets” but also all other pallets for materials handling. ISO/TC 51 decided to elaborate three parts of ISO 8611 as listed in the Foreword.

Part 2 gives the performance requirements for tests described in Part 1. The result of these tests lead to the nominal load, which represents, in general, a uniformly distributed load. The nominal load is a value in kg, established by test, valid for a given pallet configuration. In use, the pallets are loaded in different ways and it is important for the user to know the maximum working load under different conditions. Part 3 lays down the methods of determining the maximum working load of a pallet with different types, distributions, arrangements and means of stabilization of the load and the system of support. The maximum working load may be included in the relevant specification.



# Pallets for materials handling — Flat pallets —

## Part 3: Maximum working loads

### 1 Scope

This part of ISO 8611 proposes relevant test methods to determine a range of maximum working loads for different payloads and loading and support conditions, which depend on the nature of the load being carried.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 445, *Pallets for materials handling — Vocabulary*

ISO 8611-1:2004, *Pallets for materials handling — Flat pallets — Part 1: Test methods*

ISO/TS 8611-2:2005, *Pallets for materials handling — Flat pallets — Part 2: Performance requirements and selection of tests*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 445 and the following apply.

#### 3.1

##### **concentrated load**

load concentrated over an area of less than 50 % of the pallet top deck

#### 3.2

##### **uniformly distributed unbonded load**

load spread evenly across the full surface of the pallet top deck where the packages are not interlocked, bound or connected

#### 3.3

##### **uniformly distributed bonded load**

load spread evenly across the full surface of the pallet top deck, where the pattern of each single layer changes, so that the packages are interlocked

#### 3.4

##### **solid load**

single, compact, rigid, homogeneous load, supported by all the blocks and/or stringers (bearers) of the pallet

### 3.5

#### **maximum working load**

greatest payload that a pallet may be permitted to carry in a specific loading and support condition

NOTE This varies according to the type, distribution, arrangement and means of stabilization of the load and the system of support and can be lower or higher than the nominal load. See ISO/TS 8611-2.

### 3.6

#### **payload**

$Q$

load carried by the pallet in use

[ISO/TS 8611-2]

NOTE 1 Adapted from ISO 445.

NOTE 2 This can be above, identical with or below the nominal load.

### 3.7

#### **racking**

storage of loaded pallets in beam racks

### 3.8

#### **stacking**

placing of pallets with unit loads one upon the other without recourse to intermediate shelves or racking

## 4 Determination of maximum working load

### 4.1 General

The maximum working load shall be determined by the appropriate tests as given in 4.2 to 4.4

Test the pallet in the direction of its intended use. When the pallet is to be supported in both directions in a rack or on forks, the weaker direction may be determined and used for determining the maximum working load.

In order to establish the weakest pallet support direction relative to pallet length or width, when conducting test No. 4b, (Forklifting test – bending stiffness) and test No. 7, (Dead-weight bending test) of ISO 8611-1:2004, test one pallet across the length of the pallet and then a second pallet across the width of the pallet. There is no requirement for further tests on the stronger dimension unless the result is within 15 % of the weaker.

### 4.2 Pallets for handling of goods inclusive of racking

Pallets intended for handling of goods inclusive of racking shall be tested using test No. 4b Forklifting test, test No. 6 (Stacking test) and test No. 7 (Dead-weight bending test) as given in 8.4, 8.6 and 8.7 of ISO 8611-1:2004.

NOTE Most often test No. 7 Dead-weight bending will be limiting. If it is known that one condition of use is limiting, only those tests necessary for that condition need be conducted.

### 4.3 Pallets for handling of goods and stacking but without racking

Pallets intended for handling of goods and stacking without racking shall be tested using test No. 4b (Fork-lifting test), as given in 8.4 of ISO 8611-1:2004, ISO/TS 8611-2:2005 Table 1, and using test method 6 (Stacking test), as given in 8.6 of ISO 8611-1:2004 and ISO/TS 8611-2:2005 Table 1.

The maximum working load shall be the lowest value achieved in test No. 4b or test No 6.

NOTE If it is known that one condition of use is limiting, only the test necessary for that condition need be conducted.

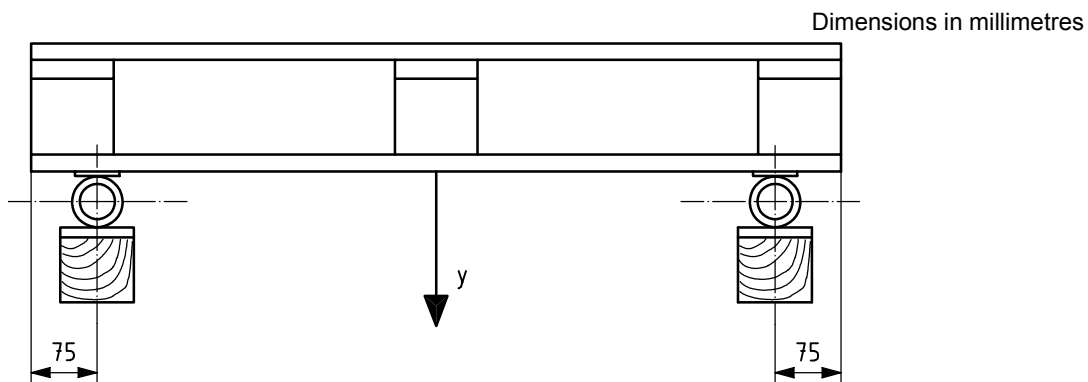
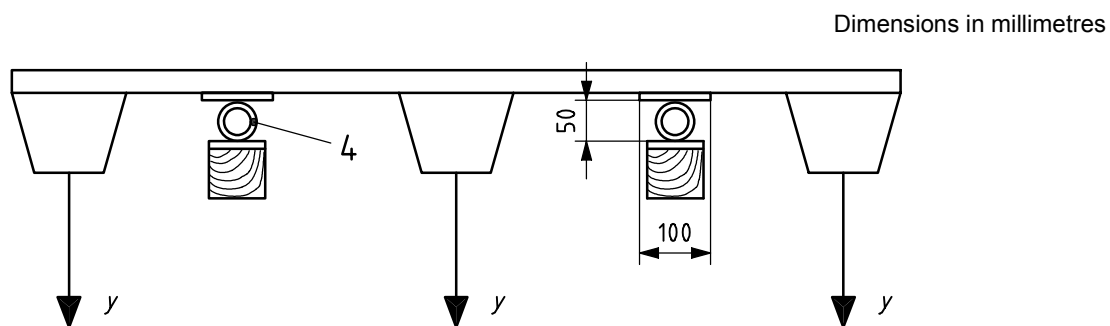
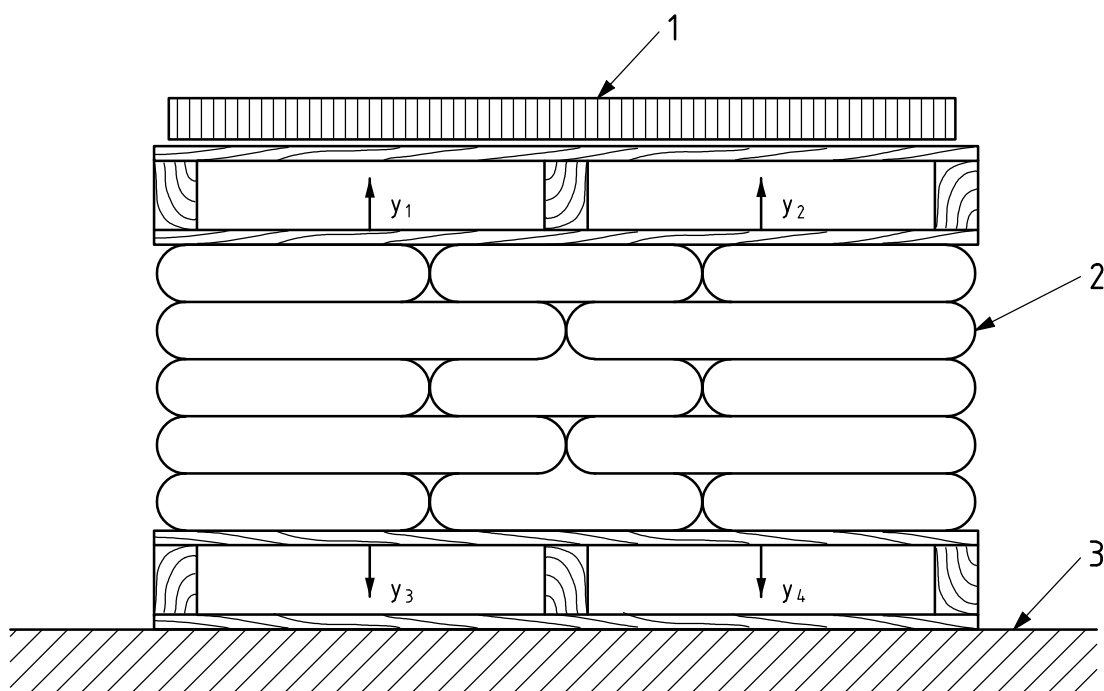


Figure 1 — Test for racking conditions



a) Test No. 4b: Forklift test

**Key**

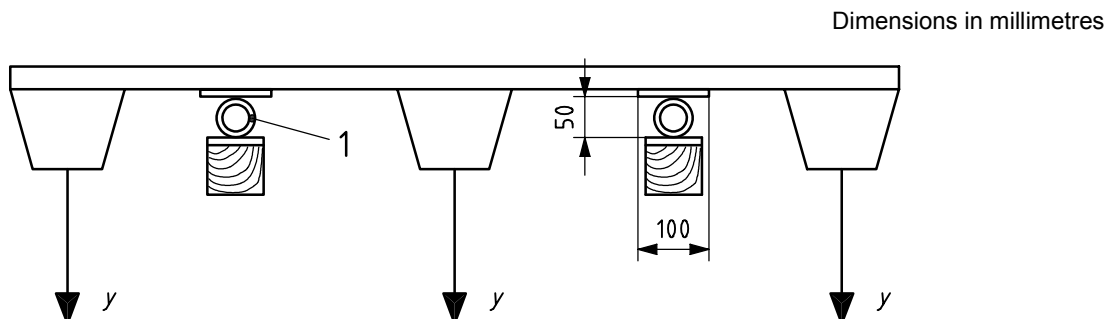
- 1 test load or payload
- 2 payload or standard test load from 5.2
- 3 load support
- 4 support

b) Test No. 6: Stacking test

Figure 2 — Test for stacking condition

#### 4.4 Pallets for handling without racking or stacking

Pallets intended for use in the transportation of goods on forklift trucks or pallet trucks without racking or stacking shall be tested using Test No. 4b (Fork-lifting test), as given in 8.4 of ISO 8611-1:2004, ISO/TS 8611-2:2005 Table 1.



#### Key

1 support

Figure 3 — Test for handling of goods

### 5 Test conditions

#### 5.1 General

Carry out *either* the test given in 5.2 *or* the test given in 5.3.

#### 5.2 Testing of pallets with known payload

Pallets with known payload shall be tested using the test method which corresponds to their proposed end application according to 4.2 to 4.4. The test load shall be the actual load.

NOTE For known payload, stretchwrapping, strapping and other load binders can be used.

#### 5.3 Testing of pallets with unknown payload

##### 5.3.1 General

Pallets with unknown payload shall be tested using the test methods which correspond to their intended support condition according to 4.2 to 4.4. The standardized test loads given in 5.3.2 to 5.3.5 shall be used.

##### 5.3.2 Concentrated load

Place the test load as shown in Figure 4, with a width of 1/3 of pallet length or width and a length equal to the pallet length or width on to the centre of the pallet deck.

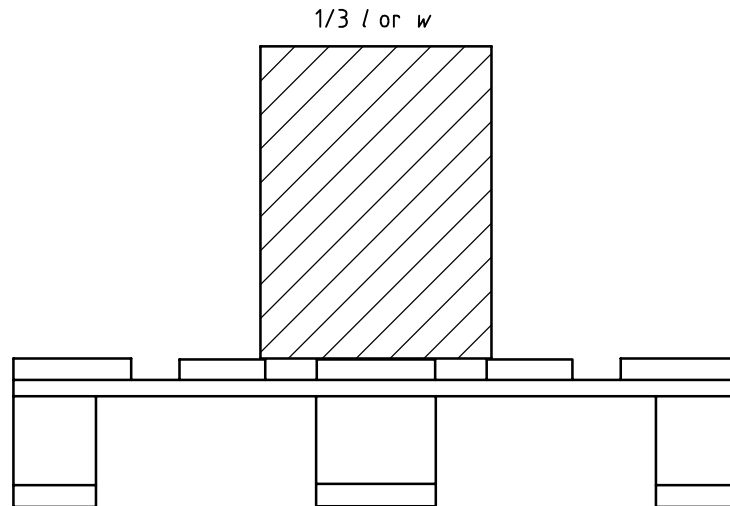
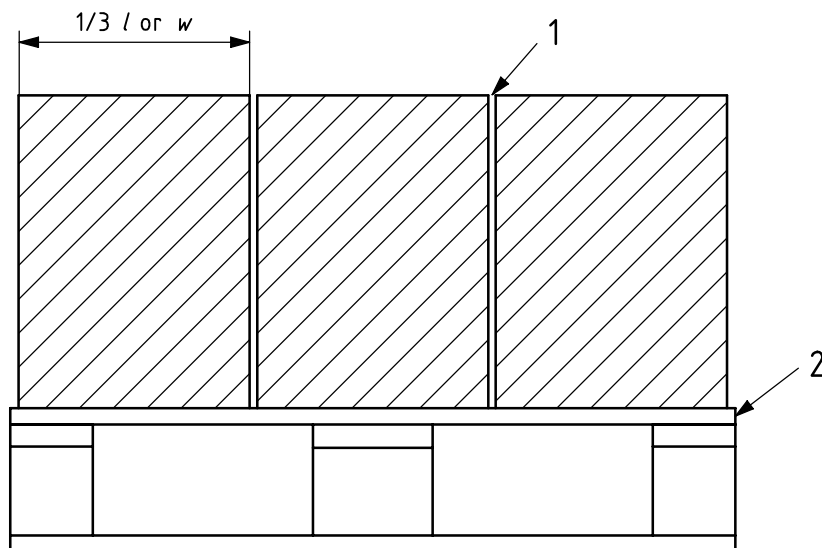


Figure 4 — Concentrated load

### 5.3.3 Uniformly distributed unbonded load

Place the test load as shown in Figure 5, composed of packages which have a length and width of  $1/3$  of the pallet length or width, to cover the whole surface (at least 85 %) of the pallet deck. The packages shall not be bonded.

NOTE Gaps of at least 4 mm between the packages should prevent mutual contact.



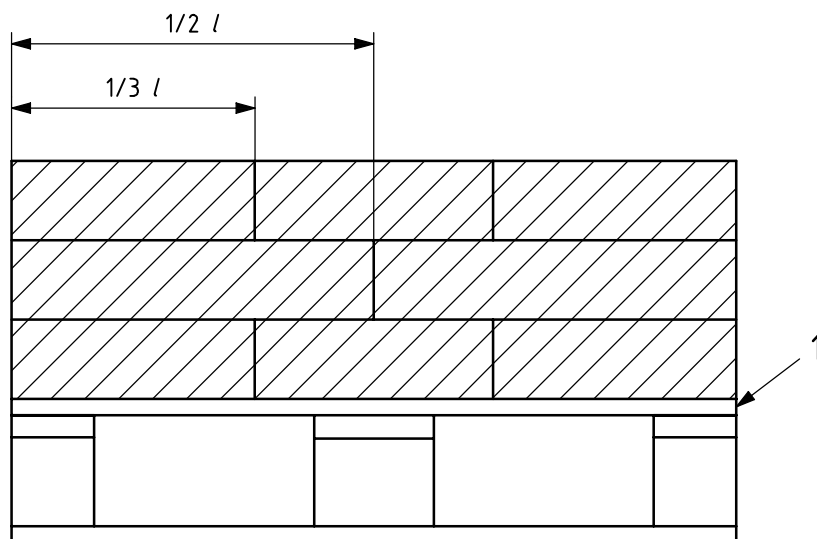
#### Key

- 1 gap between load packages
- 2 pallet top deck

Figure 5 — Uniformly distributed load

### 5.3.4 Uniformly distributed bonded load

Place the test load as shown in Figure 6, composed of packages which have a length of  $\frac{1}{2}$  of the pallet length and a width of  $\frac{1}{3}$  of the pallet length, to cover the whole surface (at least 85 %) of the pallet deck.



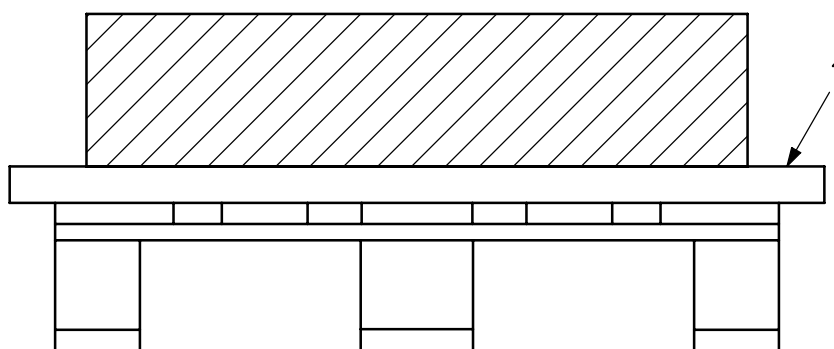
#### Key

1 pallet top deck

Figure 6 — Uniformly distributed bonded load

### 5.3.5 Solid load

Place a rigid load board on the whole surface of the pallet deck as shown in Figure 7. Place the test load (which includes the mass of the load board) on the load board.



#### Key

1 rigid load board

Figure 7 — Solid load

## 6 Measurement

The maximum deflection,  $y$ , (see Figures 1, 2 and 3) in any of the tests shall be as given in Table 1 of ISO/TS 8611-2:2005, except for the solid load tests, which shall be limited according to the criteria for test No. 5b (compression stiffness) in Table 1 of ISO/TS 8611-2:2005. The lowest mass of the payload or the mass of the test load which causes the deflection to reach this limit, shall be the maximum working load in this loading condition.

## 7 Test report

The test report shall be in accordance with Clause 11 of ISO 8611-1:2004, including whether the tests were conducted in accordance with 5.2 or 5.3 and, for 5.2, a description of the payload.

## Annex A (informative)

### Example for presentation of maximum working load

#### A.1 Examples of maximum working loads in racking conditions

Examples of the maximum working load in racking conditions as shown in Figure A.1 are listed in Table A.1.

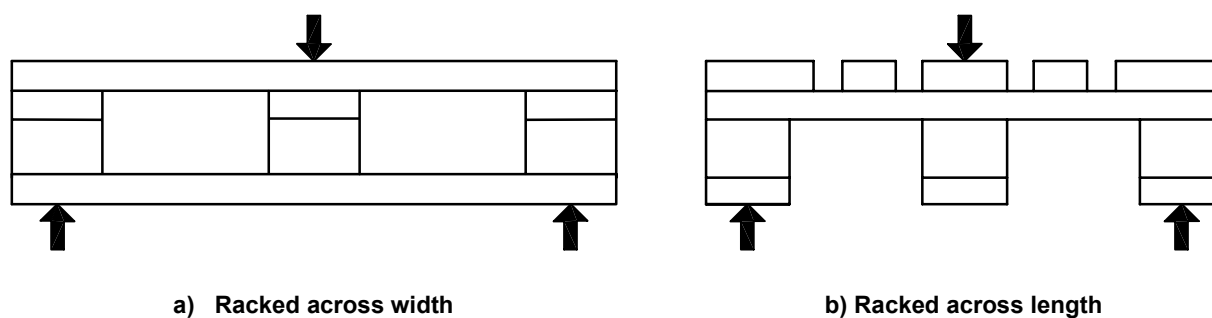


Figure A.1 — Maximum working load in racking conditions

Table A.1 — Maximum working loads in racking conditions

Type of load	Maximum working loads	
	Spanning pallet width	Spanning pallet length
Concentrated load	1 200 kg	800 kg
Uniformly distributed unbonded load	1 500 kg	1 250 kg
Uniformly distributed bonded load	1 800 kg	1 500 kg
Solid load	2 000 kg	2 000 kg



## A.2 Examples of maximum working loads in stacking conditions

Examples of the maximum working load in stacking conditions as shown in Figure A.2 are listed in Table A.2.

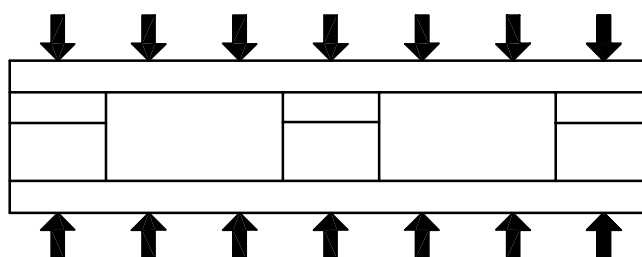


Figure A.2 — Maximum working load in stacking condition

Table A.2 — Maximum working loads in stacking condition

Type of load	Maximum working load
Uniformly distributed unbonded load	3 000 kg
Uniformly distributed bonded load	3 500 kg
Solid load	4 000 kg

## A.3 Examples of maximum working loads when lifted by forklifts or pallet trucks

Examples of maximum working loads when lifted by forklifts or pallet truck as shown in Figure A.3 are listed in Table A.3.

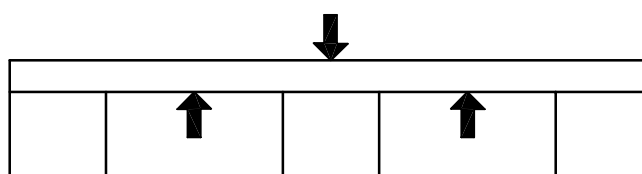


Figure A.3 — Maximum working load when lifted by forklifts or pallet trucks

Table A.3 — Maximum working load when lifted by forklifts or pallet trucks

Type of load	Maximum working load
Concentrated load	1 200 kg
Uniformly distributed unbonded load	1 600 kg
Uniformly distributed bonded load	1 900 kg
Solid load	2 200 kg

## Bibliography

- [1] ISO 6780, *Flat pallets for intercontinental materials handling — Principal dimensions and tolerances*
- [2] ISO/TR 10232, *General-purpose flat pallets for through transit of goods — Design rating and maximum working load*
- [3] ISO/TR 10233, *General-purpose flat pallets for through transit of goods — Performance requirements*



